

***Chartergellus golfitensis* West-Eberhard: a new species of Neotropical swarm-founding wasp (Hymenoptera: Vespidae, Polistinae) with notes on the taxonomy of *Chartergellus zonatus* Spinola**

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*Abstract.*—*Chartergellus golfitensis* West-Eberhard new species, is described from Central America and compared with *C. zonatus* Spinola, a species heretofore inadequately described.

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*Chartergellus* is a genus of Epiponini (Hymenoptera, Vespidae, Polistinae) ranging from southeastern Brazil to Costa Rica (West-Eberhard et al. 2006). The taxonomic background of *Chartergellus* is somewhat troublesome. It was described by Bequaert (1938) as a subgenus of *Chartergus sensu* Bequaert. The use of the name *Chartergus* was due to overlooking the type designation for that genus, and Bequaert (1943) pointed out that the name *Parachartergus* von Ihering, 1904 was correct. Bequaert (1938) designated as type species *Vespa frontalis* Fabricius, 1804, the only species included in *Chartergellus*. Richards (1978) raised *Chartergellus* to genus, and pointed out that *Vespa frontalis* Fabricius was preoccupied by *Vespa frontalis* Latreille 1802. He proposed *C. amazonicus* as a replacement name, and described five new species: *C. atectus* Richards 1978, *C. communis* Richards 1978, *C. nigerrimus* Richards 1978, *C. punctatior* Richards

1978, and *C. sanctus* Richards 1978. He treated *Chartergus zonatus* Spinola 1851, as an unrecognized species and did not include it in his key, because the description “does not agree fully with any specimens I have seen of *Chartergellus*” (Richards 1978: 217). Most recently an eighth species has been added, *C. afoveatus* Cooper 1993.

With the exception of *C. atectus* (see Richards 1978, and below), the species of *Chartergellus* build nests consisting of multiple combs attached laterally to the substrate by pedicels and covered by an envelope of a single sheet, with the entrance a short spout (Wenzel 1998). The envelope may be irregular, with the lines of construction evident and contributing to camouflaging of the nest. *Chartergellus* is characterized by having a prominent curved bristle on the third labial palpomere, the maxillary palpi five-segmented and labial palpi three-segmented, lacking



Figs 1–8. *Chartergellus golfitensis* West-Eberhard new species. Holotype. 1. Habitus. Lateral view. 2. Dorsal view. 3. Head, frontal view. 4. Head, lateral view. 5. Head, dorsal view. 6. Mesosoma, dorsal view. 7. Mesosoma, lateral view. 8. Scutellum, metanotum and propodeum, dorsal view. Scale bars = 1 mm.

an occipital carina, the mesepisternum lacking a dorsal groove, and the metanotum rounded (Carpenter 2004).

Previously, only *Chartergellus atectus* was recorded for the Costa Rican fauna (Richards 1978). We describe here *Chartergellus golfitensis*, a new species from Costa Rica.

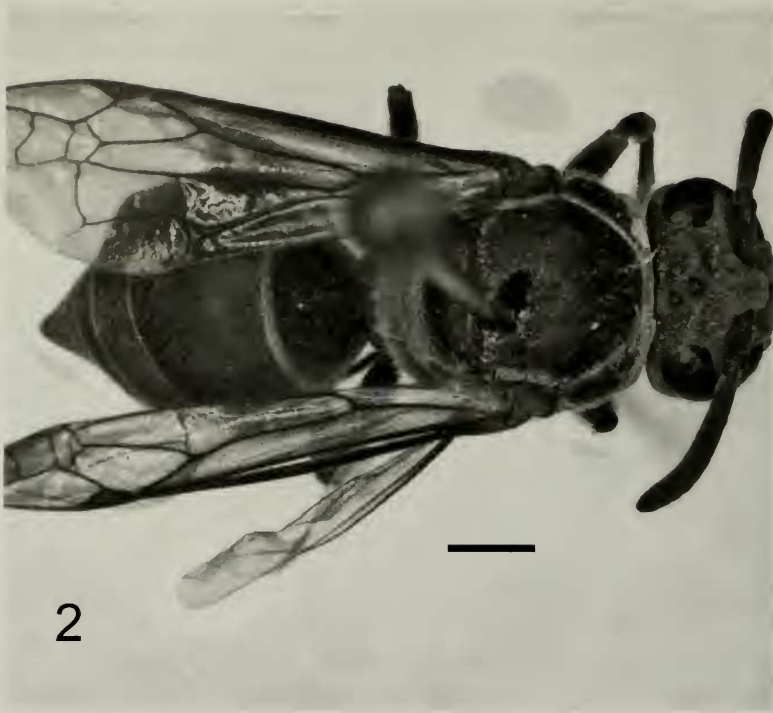
*Chartergellus golfitensis* West-Eberhard,  
new species  
(Figs 1–9)

**Diagnosis.**—*Chartergellus golfitensis* is distinguished by the presence of a raised black-lipped arc at the base of the mandible; clypeus in short contact with eye; pale markings on the scutellum; frons with three-pointed reddish brown mark with the central point nearly reaching the median ocellus and in the intraocular space to the center of the ocular sinus; and a broad pale stripe along the entire length of the gena, usually without red or black region below, which when present is no

wider than the diameter of the median ocellus.

**Description.**—*Female.* Holotype fore wing length 6.72 mm.

**Color.** Black. Reddish brown: clypeus, first antennal segment and flagellum beneath, malar space, lower 3/4 of the head, mandibles except teeth, fore tibia, tips of tarsi. Whitish anterior stripes on metanotum curved at margin of propodeum, pronotal carina, and broadly along entire length of gena. Wings hyaline, venation brownish. **Head.** Eyes with short sparse hairs, touching clypeus for short distance. Clypeus wider than long (median length  $\times$  width at middle = 0.74). Entire surface of head pubescent except for malar space and gena posterior to it, and clypeus below level of eyes, where there are long bristles. Frons with sparse and shallow punctures. Malar space present, about as wide as length of fourth antennomere. Gena with width equal to width of compound eye. Widest part of eye seen from front only half length of first antennomere. Vertex



Figs 1-8. Continued.



Figs 1-8. Continued.





Figs 1-8. Continued.

hairs present, sparser and shorter than those of frons which are nearly as long as bristles of clypeus below level of eyes. Base of mandible with raised rim, forming an

arc with a black basal lip, dorsal third covered by lateral clypeal lobe. Mandible smooth, outer surface with a few long bristles. *Mesosoma*. Pronotum, scutum and



Figs 1-8. Continued.



Figs 1-8. Continued.



Figs 1-8. Continued.



Figs 1–8. Continued.

scutellum with fine, dense punctation and covered with straight hairs. Mesepisternum with scrobal furrow beginning at margin beneath tegula and curving posteriorly to form a gentle arc about half as long as the mesepisternum, which is rounded anterior to the furrow. Dorsal pronotal carina well developed, ending close to the posterior margin. Pronotal

fovea present. Propodeum without posterior concavity, with hairs on entire surface, propodeal valve narrow throughout.

*Male.*

*Color.* As in female but metasoma (gaster) and legs dark brown. Reddish-brown of face fills entire ocular sinus and lacks three medial peaks on frons. Whitish genal stripe touching eye. Additional white:

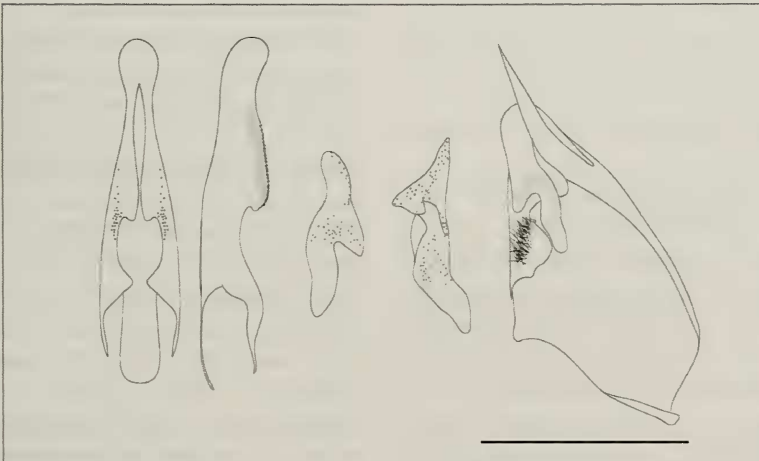


Fig. 9. Male genitalia of *Chartergellus golfitensis*. From left to right, aedeagus in ventral view, aedeagus in lateral view, digitus, cuspis and paramere. Scale bar = 1 mm.



stripe anterior to scrobal furrow, and coxae. *Head*. Mandibles with silvery appressed hairs on basal half of outer surface, apical half with a few long bristles, under-surface covered with long hairs. Clypeus as long as wide (L:W = 1.06), in extensive contact with eyes except for a short distance dorsally, and covered with silvery pubescence, ventrally forming a dense band of long appressed bristles which gleam in direct light as do similar hairs on lateral portions of frons, white portions of coxae, and a thin line on curved distal margin of last metasomal sternum. Malar space about half as wide as length of fourth antennomere. Gena only about half width of eye. Widest part of eye seen from front as long as first antennomere; saber-like ventral mandibular tooth longer and sharper-edged than in female.

*Male genitalia* (Fig. 9). Aedeagus serrate beneath. Ventral process (at base of serrate portions of aedeagus) forming a "U" with outer end sharply pointed, as in *C. communis* (Richards 1978, fig.88b). Serrations: proximal nine very fine and triangular (pointed), more distal 25 broader, curved on the posterior edge and pointing forward. Serrate edge slightly longer than distance from end of serrations to tip of aedeagus. Parameral spine hairless, slightly curved laterad, with elongate lateral opening near tip. Inner surface of digitus with long fine hairs, longer than width of digitus seen in profile, and shorter toward tip, which is bare.

*Distribution*.—Known only from Pacific lowlands of Costa Rica.

*Habitat*.—The two observed living colonies of *C. golfitensis* (the colony of the holotype and another from the same locality), and all other collected specimens, were found in areas of lowland humid forest. Nests were built on a vertical tree trunk and the wall of a building.

*Types*.—**Holotype**, ♀, COSTA RICA, Puntarenas Prov., Refugio de Vida Silvestre Golfito, 83°11'55"W, 8°39'25"N, 500m from the sea level. 2.i.2006 (L. Chavarría), deposited in the Mu-

seum of Zoology of the University of Sao Paulo, Sao Paulo, Brazil. **Paratypes**. In Museo de Zoología, Escuela de Biología, University of Costa Rica: **Puntarenas Prov.** 40 females, 17 males, all with the same locality and collector as the holotype. Golfo Dulce, 24 km W. Piedras Blancas, alt. 200m, iii 1992, 1♀ (Paul Hanson); 3 km SW Rincón, VI 1991, 2♀♀ (Paul Hanson); III–IV 1992, 1♀ (Paul Hanson). In Instituto Nacional de Biodiversidad (INBio), Costa Rica: **Puntarenas Prov.** Est. Agujas, Sendero Zamia, 300m. 22–30 AGO 1996. L\_S\_276750\_526550 #8318, 1♀ (E. Fletes, A. Azofeifa, M. Lobo); Albergue Cerro de Oro, 200m., 5–9 MAY 1995, L N 279650 #4745, 1♀ (B. Gamboa); 4–14 May 1995, L\_S\_280450\_517500 #5919, 1♀ (E. Alfaro); Rancho Quemado, 200m., Dic 1992, L-S 292500\_511000, 1♀ (F. Quesada); Abr 1992, 1♀ (K. Flores); 2♀♀ (D. Brenes); Jun 1992, 1♀ (F. Quesada); Est. Esquinas, Peninsula de Osa, 200m. Abr 1993, L S 301400\_542200 #2076, 1♀ (J.F. Quesada); Est. Sirena, 0–100m, P.N. Corcovado, Jun 1991, L-S270500\_508300, 1♀ (G. Fonseca); P.N. Manuel Antonio, Quepos, 80m. Abr 1993, L S 370900\_448800 #2140, 1♂ (G. Varela); Oct 1992, L-S 370900\_448800, 1♀ (G. Varela).

*Etymology*.—The name is given after the type locality, the Golfito region in Costa Rica, Central America.

*Remarks*.—INBio collecting stations Est. (Estacion) Agujas, Est. (Estacion) Esquinas, Albergue Cerro de Oro, and Rancho Quemado are all in the Osa Peninsula of southwestern Costa Rica.

The holotype and paratypes were compared with paratypes of three other species of *Chartergellus*: *C. punctatior* Richards, *C. communis*, and *C. zonatus* Spinola. The paratype of *C. punctatior* Richards, labeled as such by Richards, is from the same nest as a specimen (COLOMBIA: Valle, Anchicayá, 27.vii.73, M.J.W. Eberhard) mistakenly listed by Richards (1978: 222) as a paratype of *C. nigerrimus*. Richards (1978) listed no specimens of *C. punctatior* from Colombia in the description, but included Colombia in the distribution of this species in his key, further indicating his intention to consider the Colombian specimen (which fits the description of *punctatior*) a

paratype of this species. Besides this specimen, two other Colombian (Anchicayá) specimens of *C. punctatior* (28.ix.76, M. J. West-Eberhard) were examined by Richards in London. One was retained in the Natural History Museum, London, and the other, from the same colony, is in West-Eberhard's collection, labeled by Richards as a paratype of *C. atectus*. But it is clearly a specimen of *C. punctatior* that conforms in structure (mandibles with strong basal rim, and first metasomal tergum with broad yellow apical band) and nest type (unexceptional for the genus: combs on a rock rather than leaves, covered by a full envelope) to the published description of *punctatior*, not to those of the holotype of *C. atectus* collected at the same locality and described as having a nest unusual for the genus in being constructed between leaves and lacking a full envelope (Richards 1978). The paratype of *C. communis* examined here (BRAZIL: MT, Ilha de Bananal, Santa Isabella [*recte*: do Bananal, Santa Isabel], 25.viii.68, W. D. Hamilton) was deposited in the West-Eberhard collection by Richards. Along with other West-Eberhard voucher specimens, these paratypes will eventually be deposited in the US National Museum, Smithsonian Institution, Washington DC. We also compared a paratype female of *C. golfitensis* with three female syntypes of the Spinola type series of *C. zonatus* in the collection of the Museo di Zoologia Sistemática dell'Università di Torino, now housed in the Museo Regionale di Scienze Naturali in Turin.

Richards (1978) described three *Chartergellus* species (*amazonicus*, *punctatior*, and *communis*) as having a "raised rim" at the base of the mandible. In the *communis* paratype this is a rim-like ridge that rises abruptly forming a dark-brown-edged arc near the inner margin of the mandible, continued as a straight black line to the overlapping corner of the clypeus. In the *punctatior* paratypes and in *C. golfitensis* the arc arises less abruptly and is not continued as a line.

*Color variation*.—The colony of the type specimen contained three queens and two readily distinguished age cohorts: young individuals (16 females and 17 males), distinguished by wide clear metasomal apodeme margins with only a very thin black marginal line, as is characteristic of recently emerged vespid adults (West-Eberhard 1975), and 22 older females (including the holotype), with wide black apodeme margins. The young females resembled the queens in being lighter in color: meso- and metasoma and some parts of legs that are black in the older females are dark to light brown in the young females and queens, suggesting that the recently emerged females, although lacking sperm in the spermatheca and with undeveloped ovaries, are young queens. Queens have light brown first antennomere and nearly white mandibles. White lines at the posterior margin of the pronotum and the scrobal furrow are present in some females, absent in some (including the holotype), and a brownish spot in some, variation not correlated with age or caste. A white stripe on the distal margin of the first metasomal tergum is complete or absent in some, or at the lateral margins only in most females. A detailed morphometric analysis of both sexes and castes will be published elsewhere.

The Sendero Zamia, Rancho Quemado, and Manuel Antonio specimens have dark brown rather than reddish brown facial markings, and light markings are brown or yellowish brown rather than whitish.

#### NOTES ON *CHARTERGELLUS* *ZONATUS* SPINOLA

Spinola (1851) referred to four female specimens collected by M. Ghiliani in Pará, with the male unknown, but only three specimens are present in the Turin collection and there is no record of the location of the missing female. Examination of the remaining specimens indicate that Richards' (1978: 218) doubts regarding the Spinola (1851) description of *C. zonatus*,



resulting in its status as *incertae sedis* (Carpenter and van der Vecht 1991; Cooper 1993), are largely unjustified, though a few inaccuracies were evident (see below). Richards stated that "the description of ...*Chartergus zonatus* does not agree fully with any specimens I have seen of *Chartergellus*" but the Spinola specimens accord with Richards' (1978) generic description for *Chartergellus* in having the propodeal valve linear rather than in-curving, pronotal fovea present, widely separated from carina; hind-wing vein cu-a much longer than 1 Cu<sub>1</sub>; labial palpi with three segments (the maxillary palpi could not be seen); scrobal furrow strong; margin of mesoscutum opposite tegula strong; scutellum rounded in profile; metanotum not vertical; and occipital carina lacking.

Species level characters are as follows:

*Color.* Black. Dark brown: antennae (lighter brown at tip and beneath), legs and wing venation. Reddish-brown: clypeus and three-pointed area of frons to 1/3 distance from antennal insertions to median ocellus. Yellow: intraocular space to ocular sinus; broad genal stripe (about half width of gena) from mandible nearly to dorsal margin of eye; propodeal carina; stripe anterior to scrobal furrow and about 3/4 its length; anterior margins of scutellum, metanotum; thin stripes on margins of all sclerites bordering mesoscutum; posterior margins of terga 1, 2 (one female) or terga 1, 2, 3 (two females). Other variation: one female, labeled with a small green tag marked "Q," is darker in color than the other two: all of the markings that are yellow in the other two specimens and in the Spinola description, are brown, and all brown markings are darker brown in this specimen, which is one of those with three metasomal stripes. A female labeled "Pungono fortemente" (stung strongly) was affected by mold, so the remaining specimen, with no special label, and having yellow coloration like that described by Spinola, was used for the description reported here.

Other characters: eyes with sparse short hairs; mandible with four teeth, base with raised basal arc, scutal punctures separated by one diameter or more, scrobal furrow rises to gentle ridge at anterior side, coarsely and irregularly punctuate, with appressed hairs on posterior part and striate anterior ridge.

As suspected by Richards regarding a strongly yellow-marked species, the mandibles are not black; they are brown, with only the teeth dark brown or black, including in the darkest of the three specimens seen. The scutal margins are not yellow, as stated by Spinola; instead, it is the margin of the adjacent sclerites that are yellow; and only about half of the metanotum is yellow, not the entire metanotum.

Spinola (1851) cited Ghiliani's notes as stating that the nest of this species, in contrast to that of *Chartergus nitidulans* Fabricius, is found on the trunks of trees, and that the sting is very painful. Spinola was sent a sample of the nest carton, which he described as "terne et grisatre," (dull and grayish) but this has evidently been lost. There is no holotype labeled, hence all three specimens examined are syntypes.

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